CLAIMS

1. A wireless communication system composed of a plurality of communication stations without a relationship of a control station and controlled stations, wherein respective communication stations transmit beacons with information concerning a network described thereon with each other to configure said network.

2. A wireless communication system according to claim 1, wherein said information concerning the network is information indicating whether the local station is aware of the presence of beacons the respective stations transmitted.

3. A wireless communication system according to claim 1, wherein each of said communication stations configure said network transmits a beacon signal at a predetermined time period.

4. A wireless communication system according to claim 3, wherein each of said communication stations performs reception continuously over a time period longer than its own beacon transmission interval at least once at a predetermined time.

5. A wireless communication system according to claim 2, wherein said communication station, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from transmitting

data over a predetermined time period.

6. A wireless communication system according to claim 2, wherein said information indicating whether the local station is aware of the presence of a beacon signal the respective stations transmitted is information indicated by a relative time at which the local station transmits a beacon signal.

7. A wireless communication system according to claim 2, wherein each of said communication station determines a beacon transmission timing of the local station based on information obtained from a beacon signal which the local station can receive from other station.

8. A wireless communication system according to claim 7, wherein each of said communication stations continues to receive a beacon from other station over a predetermined time period before starting transmitting a new beacon, it memorize reception time information of a received beacon transmitted from other station as first information, and it shifts said information described in said received beacon indicating whether the local station is aware of a presence of beacon based upon said first information, and it memorize the shifted information as second information.

9. A wireless communication system according to claim 8, wherein said communication station extracts a reception timing of a

beacon, which the local station or other station can receive, from said second information, and it determines a target interval, which an interval in which a beacon reception time space becomes a maximum beacon space, and it sets a beacon transmission timing of the local station to a central time of said target interval.

10. A wireless communication system according to claim 9, wherein each of said communication stations attempts to receive a signal transmitted from other station during a predetermined time period and it memorize a time zone a beacon and other signal are received with a low frequency as third information.

11. A wireless communication system according to claim 10, wherein said communication station extracts each beacon space information, it determines a target interval, which an interval corresponding to a time zone with a low frequency at which a signal obtained from said third information, and it sets a beacon transmission timing of the local station to a central time of said target interval.

12. A wireless communication system according to claim 7, wherein said communication station which received alteration request message of a beacon transmission timing from other station determines a new beacon transmission timing.

13. A wireless communication system according to claim 1,

wherein said information concerning the network is information indicating whether the local station is in reception state in which a timing beacon signals transmit.

14. A wireless communication system according to claim 13, wherein said information indicative of whether the local station is in reception state in which timing beacon signal transmit is information indicated by a relative time from a timing the local station transmit beacon.

15. A wireless communication system according to claim 13, wherein said specific time zone in which said beacon signal is transmitted is set to a transmission prohibit interval.

16. A wireless communication system according to claim 1, wherein said beacon transmission timing of said communication stations within said network is delayed a predetermined target beacon transmission timing by a random time, and describe information indicative of a delayed amount in said beacon.

17. A wireless communication system according to claim 16, wherein said communication station, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from transmitting data over a predetermined time period.

18. A wireless communication system according to claim 16, wherein when each of said communication systems receives a beacon from other communication station, it calculates a target beacon transmission timing of said beacon transmission station from a beacon reception time in consideration of a time indicative of said delay amount.

19. A wireless communication system according to claim 18, wherein said communication station adjusts a clock of the local station in accordance with a timing of other station, when there is difference between a target beacon transmission timing of other station predicted from the clock value memorized in local station and a target beacon transmission timing which results from subtracting a timing at an intentionally delayed beacon transmission time described in a beacon from which a beacon was received in actual practice from.

20. A wireless communication system according to claim 19, wherein said communication station adjusts a clock of the local station to a timing of other station, when the target beacon transmission timing of the beacon transmission station is delayed from the target beacon transmission time predicted by the local station.

21. A wireless communication system according to claim 16,

wherein each of said communication stations describes the effect thereof in said beacon if said beacon transmission time is delayed due to an external primary factor when it transmits a beacon.

22. A wireless communication system according to claim 16, wherein said random time with which the beacon transmission timing is delayed from the target beacon transmission timing is given in the form of a pseudorandom sequence and the value of said pseudorandom sequence is transmitted as information indicative of a delayed amount described in said beacon.

23. A wireless communication system according to claim 22, wherein each of said communication stations memorizes the value of said pseudorandom sequence described in said beacon and it calculates the next beacon transmission timing of said beacon transmission station by updating a pseudorandom sequence value of every predetermined period.

24. A wireless communication system according to claim 1, wherein it sets a predetermined time period in which a beacon transmission station can transmit a packet with a priority after has transmitted said beacon signal.

25. A wireless communication system according to claim 24, wherein it sets a time period in which each communication station transmit packet based upon predetermined contention control, after

said predetermined time period in which said beacon transmission station can transmit a packet with a priority has expired.

26. A wireless communication system according to claim 25, wherein said communication station which communicates with said beacon transmission station can transmit a packet with a priority at said predetermined time period in which said beacon transmission station can transmit a packet with a priority.

27. A wireless communication system according to claim 24, wherein said communication station, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from transmitting data over a predetermined time period.

28. A wireless communication system according to claim 24, wherein each of said communication stations recognizes the state in which it does not receive a signal from other station over a predetermined time period calculated by a predetermined procedure before the local station transmits a packet, and it sets said predetermined time period to be short during it can transmit a packet with a priority.

29. A wireless communication system according to claim 28, wherein each of said communication stations recognizes the state in

which it does not receive a signal from other station over a predetermined time period calculated by a predetermined procedure before the local station transmits a packet, and it sets said predetermined time period to be long only during said predetermined time period immediately after it received a beacon from other station.

30. A wireless communication system according to claim 28, wherein each of said communication stations transmits a transmission request signal and recognizes reception of a response to said transmission request signal before the local station transmits a signal.

31. A wireless communication system according to claim 30, wherein each of said communication stations does not carry out virtual carrier sense when it received the transmission request signal correctly and it carries out virtual carrier sense when it received the response to said transmission request signal correctly.

32. A wireless communication system according to claim 28, wherein it is determined by said communication station whether or not a media is clear over a time period corresponding to a stipulated maximum signal length before transmission, when it attempts to transmit a beacon signal immediately after it is changed from the sleep state to the active state.

33. A wireless communication system according to claim 28, wherein said communication station adds a unique preamble word to the beginning of a packet, and it also adds a mid-amble of a similar unique word to every predetermined payload length.

34. A wireless communication system according to claim 24, wherein said communication station, which transmit a stream traffic extracts a plurality of time period in which a beacon is not transmitted ,and it transmits a beacon or a signal similar to the beacon in the extracted time period.

35. A wireless communication system according to claim 34, wherein said communication station transmits said signal similar to the beacon continuously or intermittently.

36. A wireless communication system according to claim 34, wherein each of said communication stations recognizes the state in which it does not receive a signal from other station over a predetermined time period calculated by a predetermined procedure before the local station transmits a packet, and it sets said predetermined time period to be short during it can transmit a packet with a priority.

37. A wireless communication system composed of a plurality of communication stations without a relationship of a control station and controlled stations, wherein each of said communication stations

performs reception operation during a predetermined time period after it has transmitted a signal, and it stops reception operations when a new signal is not transmitted during said predetermined time period until it receives a signal next or until a time at which transmission is planned.

38. A wireless communication system according to claim 37, wherein each of said communication stations configure said network transmits a beacon signal at substantially a predetermined time period.

39. A wireless communication system according to claim 38, wherein each of said communication stations performs reception continuously over a time period longer than its own beacon transmission interval at least once at a predetermined time.

40. A wireless communication system according to claim 37, wherein said communication station, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from transmitting data over a predetermined time period.

41. A wireless communication system according to claim 37, wherein when each of said communication stations holds data for other specific station, it carries out reception processing at a

time in which said specific other station transmits a beacon, and it attempts to transmit the data to said other specific station in accordance with a predetermined procedure after said other specific station has finished transmitting a beacon.

42. A wireless communication system according to claim 41, wherein said data transmitted after said other station has finished transmitting a beacon is data having a large emergency as compared with ordinary data.

43. A wireless communication system according to claim 37, wherein said communication station energizes a receiver over a predetermined time period before it transmits a signal to detect the presence or absence of a signal transmitted from other station to thereby execute access control for avoiding collision of packet communication timing with that of other station.

44. A wireless communication system according to claim 43, wherein it is determined by said communication station whether or not a media is clear over a time period corresponding to a stipulated maximum signal length before transmission, when it attempts to transmit a beacon signal immediately after it is changed from the sleep state to the active state.

45. A wireless communication system according to claim 43, wherein when each of said communication stations holds data for

other specific station, it attempts to transmit memorized data to said other specific station at the timing before said other specific station transmit beacon in accordance with a predetermined procedure.

46. A wireless communication system according to claim 45, wherein said data transmitted after said other station has finished transmitting a beacon is data having a large emergency as compared with ordinary data.

47. A wireless communication system according to claim 37, wherein each of said communication stations attempts to transmit data to a station which is recognized as a destination station in receiving mode when it transmits data.

48. A wireless communication system according to claim 37, wherein each of said communication stations attempts to receive a beacon from other station recognized by the local station if it is determined that the local station is in the communication state.

49. A wireless communication system according to claim 48, wherein each of said communication stations describes information indicating that it has data to be transmitted to specific other station in a beacon transmitted from the local station and a communication station, which received said beacon, ask the beacon transmission station to transmits an data if it is determined that said communication station holds data to be transmitted to the

beacon receive station.

50. A wireless communication system according to claim 48, wherein said wireless communication system does not attempt to receive a beacon transmitted from a specific station if it is instructed that said communication station should not communicate with said specific station even when it is set to the environment in which it is able to receive a beacon from said specific station.

51. A wireless communication system according to claim 37, wherein each of said communication stations can continue to perform reception operation during a predetermined time period after it has transmitted some signal and it can stop reception operation until it receives a signal next or until a transmission reserve time when it does not receive a signal for the local station during said predetermined time period.

52. A wireless communication apparatus operating decentralized distributed type communication environment constructed such that respective communication stations transmit beacons indicative of information concerning a network with each other at a predetermined time space comprising:

communication means for transmitting and receiving wireless data;

beacon signal generating means for generating a beacon signal indicative of information concerning the local station;

beacon signal analyzing means for analyzing a beacon signal received from a neighboring station by said communicating means; and

timing control means for controlling a beacon transmission timing at which said communication means transmits beacons.

53. A wireless communication apparatus according to claim 52, wherein said information concerning the network written in the beacon generated from said beacon signal generating means is information indicating whether or not the local station is aware of a time at which a beacon signal is transmitted.

54. A wireless communication apparatus according to claim 52, wherein said timing control means transmits a beacon signal at a predetermined time space when a communication station joins a network.

55. A wireless communication apparatus according to claim 54, wherein said communication means performs reception continuously over a time period longer than its own beacon transmission interval at least once at a predetermined time.

56. A wireless communication apparatus according to claim 53, wherein said beacon signal generating means, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from

transmitting data over a predetermined period and it energizes said communication means to transmit said beacon.

57. A wireless communication apparatus according to claim 53, wherein said information indicating whether or not the local station is aware of a time at which a beacon signal is transmitted is information indicated by a relative time between said time and a time at which the local station transmits a beacon signal.

58. A wireless communication apparatus according to claim 53, wherein each of said timing control means determines a beacon transmission time based on information obtained from a beacon signal, analyzed by said beacon signal analyzing means, from other station.

59. A wireless communication apparatus according to claim 58, wherein said timing control means continues to receive a beacon from said communication means over a predetermined time period before starting transmitting a new beacon, it holds reception time information of a received beacon transmitted from other station as first information and it shifts information described in said received beacon indicating whether or not the local station is aware of a time at which a beacon signal is transmitted based upon said information and it holds the shifted information as second information.

60. A wireless communication apparatus according to claim 59,

wherein said communication station extracts a reception time of a beacon, which the local station or the local station and other station can receive, from said second information, it determines an interval in which a beacon reception time space becomes a maximum beacon space as a target interval and it sets a beacon transmission time of the local station to a central time of said target interval.

61. A wireless communication apparatus according to claim 60, wherein said timing control means attempts to receive a signal transmitted from other station by said communication means during a predetermined time period and it holds a time zone with a small frequency at which a beacon and other signal are received as third information.

62. A wireless communication apparatus according to claim 61, wherein said timing control means extracts each beacon space information, it determines an interval corresponding to a time zone with a small frequency at which a signal obtained from said third information as a target interval and it sets a beacon transmission time of the local station to a central time of said target interval.

63. A wireless communication apparatus according to claim 58, wherein said timing control means determines a new beacon transmission time if said beacon signal analyzing means judges a beacon transmission time alteration request message from other station.

64. A wireless communication apparatus according to claim 52, wherein said information concerning the network described in a beacon generated from said beacon signal generating means is information indicating whether or not the local station is aware of a time at which a received beacon signal is transmitted.

65. A wireless communication apparatus according to claim 64, wherein said information indicative of whether or not the local station is aware of a time at which a received beacon signal is transmitted is information indicated by a relative time between said time and a transmission time of a beacon signal from the local station.

66. A wireless communication apparatus according to claim 64, wherein said specific time zone in which said beacon signal is transmitted is set to a transmission prohibit interval by information described in the beacon generated from said beacon signal generating means.

67. A wireless communication apparatus according to claim 52, wherein said timing control means delays said transmission time of a beacon signal transmitted from a communication station within said network from a predetermined target beacon transmission time by a random time and said beacon signal generating means describes information indicative of a delayed amount in said beacon.

68. A wireless communication apparatus according to claim 67, wherein said beacon signal generating means, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, adds information for prohibiting a neighboring station from transmitting data over a predetermined period to a beacon and it energizes said communication means to transmit said resultant information.

69. A wireless communication apparatus according to claim 67, wherein when said communication means receives a beacon from other communication station, said timing control means calculates a target beacon transmission time from a beacon reception time in consideration of a time indicative of said delay amount.

70. A wireless communication apparatus according to claim 69, wherein said communication station adjusts a clock of the local station in accordance with a timing of other station when a neighboring station target beacon transmission time predicted from the clock value memorized in the local station and a target beacon transmission time of a beacon transmission station which results from subtracting a time at which a beacon was received in actual practice and an intentionally delayed beacon transmission time described in a beacon are different from each other.

71. A wireless communication apparatus according to claim 70,

wherein said communication station adjusts a clock of the local station in accordance with a timing of other station when the target beacon transmission time of the beacon transmission station is delayed from the target beacon transmission time predicted by the local station.

72. A wireless communication apparatus according to claim 67, wherein said beacon signal generating means describes a delay amount of a beacon transmission time in said beacon if said beacon transmission time is delayed due to an external primary factor when it transmits a beacon under control of said timing control means.

73. A wireless communication apparatus according to claim 67, wherein said random time with which the beacon transmission time is delayed from the target beacon transmission time is given in the form of a pseudorandom sequence and the state of said pseudorandom sequence is transmitted as information indicative of a delay amount described in said beacon.

74. A wireless communication apparatus according to claim 73, wherein said timing control means holds the state of said pseudorandom sequence described in said beacon and it calculates the next beacon transmission time of said beacon transmission station by updating a pseudorandom sequence value of every predetermined period.

75. A wireless communication apparatus according to claim 52,

wherein said timing control means sets a predetermined time period in which a beacon transmission station can transmit a packet with a priority after said communication means has transmitted said beacon signal.

76. A wireless communication apparatus according to claim 75, wherein said communication station sets a time period in which each communication station performs transmission based upon predetermined contention control after said predetermined time period in which said beacon transmission station can transmit a packet with a priority has expired.

77. A wireless communication apparatus according to claim 76, wherein said communication station which communicates with said beacon transmission station can transmit a packet with a priority at said predetermined time period in which said beacon transmission station can transmit a packet with a priority.

78. A wireless communication apparatus according to claim 75, wherein said communication station, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from transmitting data over a predetermined period.

79. A wireless communication apparatus according to claim 75,

wherein said timing control means recognizes the state in which it does not receive a signal from other station over a predetermined period calculated by a predetermined procedure before the local station transmits a packet and it sets said predetermined period to be short during a predetermined time period in which it can transmit a packet with a priority.

80. A wireless communication apparatus according to claim 79, wherein said timing control means recognizes the state in which it does not receive a signal from other station over a predetermined period calculated by a predetermined procedure before the local station transmits a packet and it sets said predetermined period to be long only during said predetermined time period immediately after it received a beacon from other station.

81. A wireless communication apparatus according to claim 79, wherein each of said communication stations transmits a transmission request signal and recognizes reception of a response to said transmission request signal before said communication means transmits a signal.

82. A wireless communication apparatus according to claim 81, wherein each of said communication stations does not carry out virtual carrier sense when it received the transmission request signal correctly and it carries out virtual carrier sense when it received the response to said transmission request signal correctly.

83. A wireless communication apparatus according to claim 79, wherein it is determined by said communication station whether or not a media is clear over a time period corresponding to a stipulated maximum signal length before transmission when it attempts to transmit a beacon signal immediately after it is changed from the sleep state to the active state.

84. A wireless communication apparatus according to claim 79, wherein said communication station adds a preamble of a unique word to the beginning of a packet transmitted from said communication means and it also adds a mid-amble of a similar unique word to every constant payload length.

85. A wireless communication apparatus according to claim 75, wherein said timing control means, which received a stream traffic transmission request, extracts a plurality of intervals in which a beacon is not transmitted and it transmits a beacon or a signal similar to the beacon in said plurality of extracted intervals.

86. A wireless communication apparatus according to claim 85, wherein said communication station transmits said signal similar to said beacon continuously or intermittently.

87. A wireless communication apparatus according to claim 85, wherein each of said communication stations recognizes the state in

which it does not receive a signal from other station over a predetermined period calculated by a predetermined procedure before the local station transmits a packet and it sets said predetermined period to be short during a predetermined time period in which it can transmit a packet with a priority.

88. A wireless communication apparatus comprising a communication station of a wireless communication system composed of a plurality of communication stations without a relationship of a control station and controlled stations further comprising:

communication means for transmitting and receiving wireless data; and

control means for performing reception operation during a predetermined time period after said communication means has transmitted a signal and stopping reception operation until a signal is received next or until a transmission planned time when said communication means does not transmit a new signal during said predetermined time period.

89. A wireless communication apparatus according to claim 88, wherein said communication means transmits a beacon signal periodically at substantially a constant space.

90. A wireless communication apparatus according to claim 89, wherein said communication means continuously performs reception over a time period longer than a beacon transmission space of the

local station more than once in a decided time.

91. A wireless communication apparatus according to claim 88, wherein said communication means, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from transmitting data over a predetermined period.

92. A wireless communication apparatus according to claim 88, wherein when said communication means holds information for other specific station, it carries out reception processing at a time in which said specific other station transmits a beacon and it attempts to transmit memorized information to said other specific station in accordance with a predetermined procedure after said other specific station has finished transmitting a beacon.

93. A wireless communication apparatus according to claim 92, wherein said information transmitted after said other station has finished transmitting a beacon is information having a large emergency as compared with ordinary data.

94. A wireless communication apparatus according to claim 88, wherein said communication means energizes a receiver over a predetermined time period before it transmits a signal to detect the presence or absence of a signal transmitted from other station to

thereby execute access control for avoiding collision of packet communication timing with that of other station.

95. A wireless communication apparatus according to claim 94, wherein when said communication means attempts to transmit a signal after it has been changed from the sleep state to the active state, prior to transmission, it is determined by said control means during a time period corresponding to the stipulated maximum signal length whether or not the media is clear.

96. A wireless communication apparatus according to claim 94, wherein when each of said communication stations holds information for other specific station, it attempts to transmit memorized information to said other specific station in accordance with a predetermined procedure immediately before said other specific station transmits a beacon.

97. A wireless communication apparatus according to claim 96, wherein said information transmitted after said other station has finished transmitting a beacon is information having a large emergency as compared with ordinary data.

98. A wireless communication apparatus according to claim 88, wherein each of said communication stations attempts to transmit information to a station which is recognized as a destination station operating to receive information when it transmits

information.

99. A wireless communication apparatus according to claim 88, wherein said control means attempts to receive a beacon from other station recognized by the local station if it is determined that the local station is in the communication state.

100. A wireless communication apparatus according to claim 99, wherein each of said communication stations describes information indicating that it has information to be transmitted to specific other station in a beacon transmitted from said communication means and performs transmission after it received a transmission request signal from said other station.

101. A wireless communication apparatus according to claim 99, wherein said control means does not attempt to receive a beacon transmitted from a specific station if it is instructed by a signal received by said communication means that it should not communicate with said specific station even when it is set to the environment in which it is able to receive a beacon from said specific station.

102. A wireless communication apparatus according to claim 88, wherein said control means can continue to perform reception operation during a predetermined time period after it has transmitted some signal and it can stop reception operation until it receives a signal next or until a transmission planned time when it

does not receive a signal for the local station during said predetermined time period.

103. A wireless communication method operating under a decentralized distributed communication environment constructed when respective communication station transmit beacons with information concerning a network written therein with each other at a predetermined time space comprising the steps of:

a beacon signal generating step for generating a beacon signal in which information concerning the local station is written;

a beacon signal analyzing step for analyzing a beacon signal received from the neighboring station by said communication means; and

a timing control step for controlling beacon transmission timing at which said communication means transmits a beacon.

104. A wireless communication method according to claim 103, wherein said information concerning the network is information indicating whether or not the local station is aware of a time at which a beacon signal is transmitted.

105. A wireless communication method according to claim 103, wherein each of said communication stations joined said network transmits a beacon signal at a predetermined time space.

106. A wireless communication method according to claim 105,

wherein each of said communication stations performs reception continuously over a time period longer than its own beacon transmission interval at least once at a predetermined time.

107. A wireless communication method according to claim 104, wherein said communication station, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from transmitting data over a predetermined period.

108. A wireless communication method according to claim 104, wherein said information indicating whether or not the local station is aware of a time at which a beacon signal is transmitted is information indicated by a relative time between said time and a time at which the local station transmits a beacon signal.

109. A wireless communication method according to claim 104, wherein each of said communication station determines a beacon transmission time of the local station based on information obtained from a beacon signal which the local station can receive from other station.

110. A wireless communication method according to claim 58, wherein each of said communication stations continues to receive a beacon from other station over a predetermined time period before

starting transmitting a new beacon, it holds reception time information of a received beacon transmitted from other station as first information and it shifts information described in said received beacon indicating whether or not the local station is aware of a time at which a beacon signal is transmitted based upon said information and it holds the shifted information as second information.

111. A wireless communication method according to claim 110, wherein said communication station extracts a reception time of a beacon, which the local station or the local station and other station can receive, from said second information, it determines an interval in which a beacon reception time space becomes a maximum beacon space as a target interval and it sets a beacon transmission time of the local station to a central time of said target interval.

112. A wireless communication method according to claim 111, wherein each of said communication stations attempts to receive a signal transmitted from other station during a predetermined time period and it holds a time zone with a small frequency at which a beacon and other signal are received as third information.

113. A wireless communication method according to claim 112, wherein said communication station extracts each beacon space information, it determines an interval corresponding to a time zone with a small frequency at which a signal obtained from said third

information as a target interval and it sets a beacon transmission time of the local station to a central time of said target interval.

114. A wireless communication method according to claim 109, wherein said communication station which received a beacon transmission time alteration request message from other station determines a new beacon transmission time.

115. A wireless communication method according to claim 103, wherein said information concerning the network is information indicating whether or not the local station is aware of a time at which a received beacon signal is transmitted.

116. A wireless communication method according to claim 115, wherein said information indicative of whether or not the local station is aware of a time at which a received beacon signal is transmitted is information indicated by a relative time between said time and a transmission time of a beacon signal from the local station.

117. A wireless communication method according to claim 115, wherein said specific time zone in which said beacon signal is transmitted is set to a transmission prohibit interval.

118. A wireless communication method according to claim 103, wherein said transmission time of a beacon signal is delayed from a

predetermined target beacon transmission time by a random time and information indicative of a delayed amount is described in said beacon.

119. A wireless communication method according to claim 118, wherein said communication station, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from transmitting data over a predetermined period.

120. A wireless communication method according to claim 118, wherein when each of said communication systems receives a beacon from other communication station, it calculates a target beacon transmission time of said beacon transmission station from a beacon reception time in consideration of a time indicative of said delay amount.

121. A wireless communication method according to claim 120, wherein said communication station adjusts a clock of the local station in accordance with a timing of other station when a neighboring station target beacon transmission time predicted from the clock value memorized in the local station and a target beacon transmission time of a beacon transmission station which results from subtracting a time at which a beacon was received in actual practice and an intentionally delayed beacon transmission time

described in a beacon are different from each other.

122. A wireless communication method according to claim 121, wherein said communication station adjusts a clock of the local station in accordance with a timing of other station when the target beacon transmission time of the beacon transmission station is delayed from the target beacon transmission time predicted by the local station.

123. A wireless communication method according to claim 118, wherein each of said communication stations describes a delay amount of a beacon transmission time in said beacon if said beacon transmission time is delayed due to an external primary factor when it transmits a beacon.

124. A wireless communication method according to claim 118, wherein said random time with which the beacon transmission time is delayed from the target beacon transmission time is given in the form of a pseudorandom sequence and the state of said pseudorandom sequence is transmitted as information indicative of a delay amount described in said beacon.

125. A wireless communication method according to claim 124, wherein each of said communication stations holds the state of said pseudorandom sequence described in said beacon and it calculates the next beacon transmission time of said beacon transmission station by

updating a pseudorandom sequence value of every predetermined period.

126. A wireless communication method according to claim 103, wherein said communication station sets a predetermined time period in which a beacon transmission station can transmit a packet with a priority after said beacon transmission station has transmitted said beacon signal.

127. A wireless communication method according to claim 126, wherein said communication station sets a time period in which each communication station performs transmission based upon predetermined contention control after said predetermined time period in which said beacon transmission station can transmit a packet with a priority has expired.

128. A wireless communication method according to claim 127, wherein said communication station which communicates with said beacon transmission station can transmit a packet with a priority at said predetermined time period in which said beacon transmission station can transmit a packet with a priority.

129. A wireless communication method according to claim 126, wherein said communication station, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from transmitting

data over a predetermined period.

130. A wireless communication method according to claim 126, wherein each of said communication stations recognizes the state in which it does not receive a signal from other station over a predetermined period calculated by a predetermined procedure before the local station transmits a packet and it sets said predetermined period to be short during a predetermined time period in which it can transmit a packet with a priority.

131. A wireless communication method according to claim 130, wherein each of said communication stations recognizes the state in which it does not receive a signal from other station over a predetermined period calculated by a predetermined procedure before the local station transmits a packet and it sets said predetermined period to be long only during said predetermined time period immediately after it received a beacon from other station.

132. A wireless communication method according to claim 130, wherein each of said communication stations transmits a transmission request signal and recognizes reception of a response to said transmission request signal before the local station transmits a beacon signal.

133. A wireless communication method according to claim 132, wherein each of said communication stations does not carry out

virtual carrier sense when it received the transmission request signal correctly and it carries out virtual carrier sense when it received the response to said transmission request signal correctly.

134. A wireless communication method according to claim 130, wherein it is determined by said communication station whether or not a media is clear over a time period corresponding to a stipulated maximum signal length before transmission when it attempts to transmit a beacon signal immediately after it is changed from the sleep state to the active state.

135. A wireless communication method according to claim 130, wherein said communication station adds a preamble of a unique word to the beginning of a packet and it also adds a mid-amble of a similar unique word to every constant payload length.

136. A wireless communication method according to claim 126, wherein said communication station, which received a stream traffic transmission request, extracts a plurality of intervals in which a beacon is not transmitted and it transmits a beacon or a signal similar to the beacon in said plurality of extracted intervals.

137. A wireless communication method according to claim 136, wherein said communication station transmits said signal similar to said beacon continuously or intermittently.

138. A wireless communication method according to claim 136, wherein each of said communication stations recognizes the state in which it does not receive a signal from other station over a predetermined period calculated by a predetermined procedure before the local station transmits a packet and it sets said predetermined period to be short during a predetermined time period in which it can transmit a packet with a priority.

139. A wireless communication method for performing wireless communication in a network composed of a plurality of communication stations without a relationship of a control station and controlled stations comprising the steps of:

a transmission and reception step for performing reception operation during a predetermined time period after a signal was transmitted; and

a reception timing control step for stopping reception operation until a signal is received next or until the transmission planned time when a new signal is not transmitted during said predetermined time period.

140. A wireless communication method according to claim 139, wherein each of said communication stations joined said network transmits a beacon signal periodically at substantially a constant space.

141. A wireless communication method according to claim 140,

wherein each of said communication stations continuously performs reception over a time period longer than a beacon transmission space of the local station more than once in a decided time.

142. A wireless communication method according to claim 139, wherein said communication station, which became aware of approach of a time at which other station plans to transmit a beacon with reference to a clock value memorized in the local station, transmits information for prohibiting a neighboring station from transmitting data over a predetermined period.

143. A wireless communication method according to claim 139, wherein when each of said communication stations holds information for other specific station, it carries out reception processing at a time in which said specific other station transmits a beacon and it attempts to transmit memorized information to said other specific station in accordance with a predetermined procedure after said other specific station has finished transmitting a beacon.

144. A wireless communication method according to claim 143, wherein said information transmitted after said other station has finished transmitting a beacon is information having a large emergency as compared with ordinary data.

145. A wireless communication method according to claim 139, wherein said communication station energizes a receiver over a

predetermined time period before it transmits a signal to detect the presence or absence of a signal transmitted from other station to thereby execute access control for avoiding collision of packet communication timing with that of other station.

146. A wireless communication method according to claim 145, wherein when said communication station attempts to transmit a signal after it has been changed from the sleep state to the active state, prior to transmission, it is determined by said communication station during a time period corresponding to the stipulated maximum signal length whether or not the media is clear.

147. A wireless communication method according to claim 145, wherein when each of said communication stations holds information for other specific station, it attempts to transmit memorized information to said other specific station in accordance with a predetermined procedure immediately before said other specific station transmits a beacon.

148. A wireless communication method according to claim 147, wherein said information transmitted after said other station has finished transmitting a beacon is information having a large emergency as compared with ordinary data.

149. A wireless communication method according to claim 139, wherein each of said communication stations attempts to transmit

information to a station which is recognized as a destination station operating to receive information when it transmits information.

150. A wireless communication method according to claim 139, wherein each of said communication stations attempts to receive a beacon from other station recognized by the local station if it is determined that the local station is in the communication state.

151. A wireless communication method according to claim 150, wherein each of said communication stations describes information indicating that it has information to be transmitted to specific other station in a beacon transmitted from the local station and a communication station, which received said beacon, transmits an information transmission request signal to the beacon transmission station if it is determined that said communication station holds information to be transmitted to the local station.

152. A wireless communication method according to claim 150, wherein said wireless communication system does not attempt to receive a beacon transmitted from a specific station if it is instructed that said communication station should not communicate with said specific station even when it is set to the environment in which it is able to receive a beacon from said specific station.

153. A wireless communication method according to claim 139,

wherein each of said communication stations can continue to perform reception operation during a predetermined time period after it has transmitted some signal and it can stop reception operation until it receives a signal next or until a transmission reserve time when it does not receive a signal for the local station during said predetermined time period.

154. A computer program written in the form of a computer readable format such that processing for being operated under a decentralized distributed communication environment constructed when respective communication stations transmit beacons with information concerning a network written thereon transmit with each other at a predetermined time space is executed on a computer system comprising the steps of:

a beacon signal generating step for generating a beacon signal in which information concerning the local station is written;

a beacon signal analyzing step for analyzing a beacon signal received from a neighboring station by said communication means; and

a timing control step for controlling beacon transmission timing by said communication means.

155. A computer program written in the form of a computer readable format such that processing for making wireless communication on a network composed of a plurality of communication stations without relationship between a control station and controlled stations is executed on a computer system comprising the

steps of:

a transmission and reception step for executing reception step during a predetermined time period after a signal has been transmitted; and

a reception timing control step for stopping reception operation until a signal is received next or until a transmission planned time if said communication station does not transmit a new signal during said predetermined time period.

ABSTRACT OF THE DISCLOSURE

In order to solve problems arising when a communication system such as a wireless LAN is constructed as a decentralized distributed type network without a relationship of control station and controlled stations such as a master station and slave stations, in a wireless communication system composed of a plurality of communication stations without a relationship of control station and controlled stations, respective communication stations transmit beacons with information concerning a network written thereon with each other to construct the network, and it becomes possible to make sophisticated judgment such as communication states of other communication stations by those beacons.